REMARKS

With entry of this amendment, claims 1-29 are cancelled, without prejudice, and claims 29-62 are newly added. Applicant notes that some of the newly added claims roughly correspond to some of the cancelled claims. The following table illustrates the correlation between the pending and cancelled claim sets.

New Claims	Cancelled Claims
29	1
42	2
43	4
44, 45	5
46 - 48	6
49 – 51	7
52 – 53	10
55	21
61	8

Support for the newly added claims can be found in the specification on, e.g., page 3, lines 17-27; page 4, line 1 to page 6, line 32; page 9, lines 8-24; page 9, line 26 to page 10, line 29; page 10, line 31 to page 13, line 19; FIGS. 1-5, and the claims as originally filed.

Based on the following remarks, reconsideration of the application is respectfully requested.

Objections to Claims

The objection to claim 14 is moot in view of the cancellation of this claim, without prejudice.

Rejections to Claims

Claims 1-21 were rejected under 35 U.S.C. § 112, first paragraph for allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors had possession of the claimed invention at the time that the application was filed. These rejections are now moot in light of the cancellation of claims 1-21. Newly added claim 29, which corresponds to cancelled claim 1, addresses many of the issues raised by the examiner in reference to claim 1. For example, claim 29 is limited to a first and second sequence comprising pentopyranose monomers. In addition, the functional unit is defined by a Markush group that includes "amino acids, peptides, fluorophores having a primary or secondary amine, chromophores having a primary or secondary amine, metals, redox centers, and chelating agents." Support for this limitation can be found in the specification at, e.g., page 6, lines 1-25; page 9, lines 18-24; page 13, lines 6-19; and FIGS. 2-5 and accompanying text. The specification specifically exemplifies chelated metal atoms, not just gold atoms. Chelated metal atoms are entirely capable of serving as redox centers. Therefore, redox centers have also been included in the Markush group. Amino acids, peptides, fluorophores having primary and secondary amines, and chromophores having primary and secondary amines have also been included. Support for these functional units can be found in the specification in FIGS. 1-2, example 4 on page 11, line 7 – page 13, line 14, and page 6, lines 1-25. FIG. 1 clearly illustrates amino acids coupled to the nucleobases. Once a single amino acid is coupled to the nucleobase, it is well known to a person skilled in the art how to couple additional amino acids to the attached amino acid to form a peptide. And in FIG. 2, the examples given for the functional units include a metal cluster, chromophore, metals, and metal ions. In addition, example 4 describes the attachment of an amine functional group to a

pentropyranose. The chemistry used to couple this functional unit is the standard active ester chemistry used for the coupling of amines. Therefore, the chemistry shown in this example is applicable to any amine-containing moieties, e.g., amino acids, peptides, fluorophores containing an amine, and chromophores containing an amine (e.g., azobenzene). New claim 29 addresses the concerns raised by the Examiner, and therefore, Applicant respectfully requests withdrawal of the rejection and reconsideration of the pending claims.

Claim 21 was rejected under 35 U.S.C. § 112, first paragraph for allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors had possession of the claimed invention at the time that the application was filed. Newly added claim 55 corresponds to cancelled claim 21. As requested by the examiner, support for the newly added claim can be found in the specification on, e.g., page 6, lines 81-32.

Claims 1, 3-9, 11, 12, and 14-21 were rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. These rejections are now moot in view of the cancellation of claims 1-21. Applicant respectfully requests withdrawal of the rejection and reconsideration of the pending claims.

Newly added claim 29, which corresponds to cancelled claim 1, does not suffer from the alleged problems to which the Examiner referred. In particular, claim 29, and its dependent claims, does not contain the terms "essentially nonhelical" or "nonhelical." And although the term "functional unit" is still used in claim 29, it is clearly defined by a Markush group.

CONCLUSION

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

Applicants submit that the claims, as amended, are free of the cited art and are in position for allowance. Any fees required by this submission may be charged to counsel's Deposit Account No. 50-0639. If the Examiner has any questions regarding this communication, or feels that an interview might facilitate prosecution of the application, he is invited to contact the undersigned at (949) 737-2900.

Respectfully submitted,

O'MELVENY & MYERS LLP

Dated: September 9, 2002

By: John Kappos
John Kappos
Reg. No. 37,861

400 South Hope Street
Los Angeles, CA 90071-2899
(213) 430-6000

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please cancel claims1-28, without prejudice.

Please add the following new claims.

29. (New) A supramolecular nanosystem comprising:

a first oligomer comprising pentopyranose monomers;

a second oligomer comprising pentopyranose monomers, wherein the second oligomer is capable of pairing non-covalently with the first oligomer; and

a functional unit coupled to the second oligomer, wherein the functional unit is selected from the group consisting of amino acids, peptides, fluorophores having an amine, chromophores having an amine, metals, redox centers, and chelating agents.

30. (New) The supramolecular nanosystem of claim 29, wherein the second oligomer further comprises at least one nucleobase, and wherein the functional unit is coupled to the nucleobase.

31. (New) The supramolecular nanosystem of claim 29, wherein the functional unit is coupled directly to a pentopyranose monomer of the second oligomer.

32. (New) The supramolecular nanosystem of claim 29, wherein the functional unit comprises a metal, and wherein the second oligomer further comprises at least one nucleobase, and wherein the metal binds to the at least one nucleobase.

33. (New) The supramolecular nanosystem of claim 30, wherein the functional unit is a chelating agent.

34. (New) The supramolecular nanosystem of claim 33, further comprising a metal, wherein the metal is bound to the chelating agent.

35. (New) The supramolecular nanosystem of claim 34, further comprising a second chelating agent coupled to the first oligomer, wherein the second chelating agent is bound to the metal.

36. (New) The supramolecular nanosystem of claim 35, wherein the metal is gold (Au).

37. (New) The supramolecular nanosystem of claim 36, wherein the chelating agent comprises a maleimido moiety.

38. (New) The supramolecular nanosystem of claim 34, wherein the metal is nickel (Ni).

39. (New) The supramolecular nanosystem of claim 29, wherein the functional unit comprises a redox center, wherein the second oligomer further comprises at least one nucleobase, and wherein the redox center binds to the at least one nucleobase.

40. (New) The supramolecular nanosystem of claim 39, wherein the redox center is one of an electron donor or an electron acceptor.

41. (New) The supramolecular nanosystem of claim 40, wherein the redox center is selected from the group consisting of a quinone and hydroquinone.

42. (New) The supramolecular nanosystem of claim 29, wherein the first oligomer forms a hairpin loop.

43. (New) The supramolecular nanosystem of claim 29, wherein the pentopyranose monomers are selected from the group consisting of a ribose, arabinose, lyxose, and xylose.

44. (New) The supramolecular nanosystem of claim 29, wherein the pentopyranose monomers have the D configuration.

45. (New) The supramolecular nanosystem of claim 29, wherein the pentopyranose monomers have the L configuration.

46. (New) The supramolecular nanosystem of claim 29, wherein the first oligomer is longer than the second oligomer.

47. (New) The supramolecular nanosystem of claim 29, wherein the length of the first oligomer is between about 10 and 500 monomer units.

48. (New) The supramolecular nanosystem of claim 29, wherein the length of the first oligomer is between about 10 and 100 monomer units.

49. (New) The supramolecular nanosystem of claim 29, wherein the length of the second oligomer is between about 4 and 50 monomer units.

50. (New) The supramolecular nanosystem of claim 29, wherein the length of the second oligomer is between about 4 and 25 monomer units.

51. (New) The supramolecular nanosystem of claim 29, wherein the length of the second oligomer is between about 4 and 15 monomer units.

52. (New) The supramolecular nanosystem of claim 29, wherein the length of the second oligomer is between about 4 and 8 monomer units.

53. (New) The supramolecular nanosystem of claim 29, wherein the first oligomer further comprises at least one nucleobase selected from the group consisting of adenine, guanidine, isoguanidine, cytosine, thymine, uracil, 2,6-diaminopurine, and xanthine.

54. (New) The supramolecular nanosystem of claim 29, wherein the second oligomer further comprises at least one nucleobase selected from the group consisting of adenine, guanidine, isoguanidine, cytosine, thymidine, uracil, 2,6-diaminopurine, and xanthine.

55. (New) The supramolecular nanosystem of claim 29, wherein the first oligomer is linked to the second oligomer after pairing by a coupling reaction selected from the group consisting of covalent crosslinking, metathesis, Heck coupling, Michael addition, and oxidation reactions.

56. (New) The supramolecular nanosystem of claim 29, further comprising a third oligomer comprising pentopyranose monomers, wherein the third oligomer is capable of pairing non-covalently with the first oligomer, and wherein the third oligomer is not capable of pairing non-covalently with the second oligomer.

57. (New) The supramolecular nanosystem of claim 56, wherein the third oligomer is different than the second oligomer, and wherein the third oligomer is not capable of pairing non-covalently with the second oligomer.

58. (New) The supramolecular nanosystem of claim 56, wherein the third oligomer is the same as the second oligomer, and wherein the third oligomer is not capable of pairing non-covalently with the second oligomer.

59. (New) The supramolecular nanosystem of claim 29, further comprising a second functional unit coupled to the second oligomer, wherein the functional unit is selected from the group consisting of amino acids, peptides, fluorophores having an amine, chromophores having an amine, metals, redox centers, and chelating agents.

60. (New) The supramolecular nanosystem of claim 29, wherein the functional unit is a chelating agent, and wherein the chelating agent is coupled directly to the pentopyranose monomer of the second oligomer.

61. (New) The supramolecular nanosystem of claim 29, wherein the pentopyranose monomers are connected by a linkage selected from the group consisting of thiophosphate, alkylated phosphate, phosphonate, and amide.

62. (New) The supramolecular nanosystem of claim 29, wherein the chromophore is azobenzene.